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10/540,867	06/27/2005	Ken Nishimura	043888.0380	4018

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MCDERMOTT WILL & EMERY LLP
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096

EXAMINER	
RADEMAKER, CLAIRE L	
ART UNIT	PAPER NUMBER
1795	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,867	NISHIMURA ET AL.	
	Examiner	Art Unit	
	CLAIRE L. RADEMAKER	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 November 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,3 and 5-50* is/are pending in the application.

4a) Of the above claim(s) *5,6 and 37-50* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,3 and 7-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/29/09 & 11/13/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This office action is in response to the amendment filed on November 20, 2009. Claims 2-3 & 7-36 are pending. Claims 5-6 & 37-50 are withdrawn due to restriction. Claims 1 & 4 are cancelled. Claims 2, 11, 14-15, & 18 are amended.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on August 20, 2009.

Information Disclosure Statement

3. The information disclosure statements filed October 29, 2009 and November 13, 2009 fail to comply with 37 CFR 1.98(a)(3) because they do not contain translations of the Japanese Office Actions submitted corresponding to Application Numbers JP 2003-024987, 2003-018924, 2003-023619, and 2003-051253. Therefore these listings have been crossed out and not considered.

Additionally, the information disclosure statement filed November 13, 2009 fails to comply with 37 CFR 1.98(a)(3) and has been Xed out because:

1) all but one (1) reference was cited in the October 29, 2009 IDS; and

2) the IDS does not contain a translation of the Japanese Office Actions submitted corresponding to Application Number JP 2003-023620. Therefore this listing has not been considered.

Claim Analysis

4. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 2003/0104273) in view of Longhi, Jr. et al. (US 6,923,837) are withdrawn, because Applicant's argument are persuasive.

Claim Rejections - 35 USC § 103

5. Claims 2-3, 7-10, & 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 2003/0104273) in view of Longhi, Jr. et al. (US 6,923,837).

With regard to claims 2-3, 7-8, & 24, Lee et al. teaches an electrochemical device (paragraphs [0002], [0020], & [0112]) comprising an electrode plate assembly (EPA) (paragraphs [0028] & [0054]), said EPA comprising:

At least one first electrode (8, paragraph [0054]; Figure 3) comprising a first current collector sheet (11, paragraph [0054]; Figure 3) and at least one first electrode mixture layer carried thereon (13, paragraph [0054]; Figure 3),

At least one second electrode (7, paragraph [0054]; Figure 3) comprising a second current collector sheet (12, paragraph [0054]; Figure 3) and at least one first electrode mixture layer carried thereon (14, paragraph [0054]; Figure 3), and

A separator interposed between the first electrode and the second electrode (15, paragraph [0055]; Figure 3),

Where said first current collector sheet comprises a first edge that has a part that extends from a first side of said EPA and does not carry said first electrode mixture on it

(Figure 3), and where said second current collector comprises a second edge that has a part that extends from a second side of said EPA and does not carry said second electrode mixture on it (Figure 3),

and where at least one of the current collector sheets of the outermost two electrodes has a conductive area on both sides and has an electrode mixture layer only on one side facing the inner electrode (paragraphs [0060]-[0061] & [0112]; Figure 3),

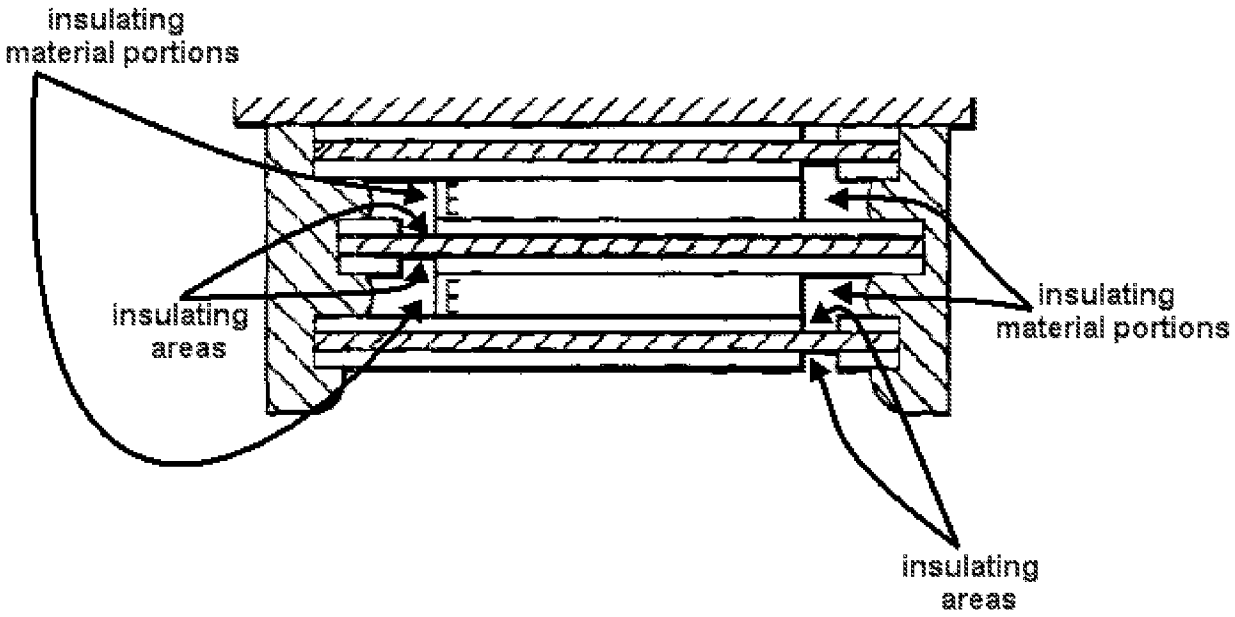
But fails to teach first and second terminals, or teach that at least one of said first and second current collector sheets has a conductive area and an insulating area, or teach the specified orientation of said conductive areas and insulating areas with said first and second terminals, or teach first and second insulating material portions.

Longhi, Jr et al. teaches the concept of an EPA having a first electrode & current collector sheet extend from a first side of said EPA and having a second electrode & current collector extend from a second side of said EPA, where said first side face and said second side face are positioned on opposite sides of said EPA (col. 8, lines 52-67 & col. 4, lines 29-30 & 37-44; Figure 10), where a first terminal / shooping electrically connects to said first electrode & current collector sheet and a second terminal / shooping electrically connects to said second electrode & current collector sheet, such that said first terminal / shooping is provided on said first side face of said EPA and said second terminal / shooping is provided on said second side face of said EPA (col. 8, lines 52-67; Figure 10), and where said first electrode & current collector sheet and said second electrode & current collector sheet each have a conductive area connected to and buried in said first and second terminals, respectively, (col. 8, lines 52-67; Figure

10) and each have an insulating area (90, col. 8, lines 60-67; Figure 10) on said second and first side faces, respectively (col. 8, lines 60-67; Figure 10), and where said first side face has a first insulating material portion / air gap for insulating said first terminal from said second electrode (col. 8, lines 60-67; Figure 10), and where said second side face has a second insulating material portion / air gap for insulating said second terminal from said first electrode (col. 8, lines 60-67; Figure 10),

and where the end current collector sheets of the outermost two electrodes each have a conductive area on both sides such that the conductive area on the outermost side of each of said current collectors are electrically connected to said respective terminals and serve as an extended part of said respective terminals (col. 4, lines 29-30 & 37-44 &; Figure 10).

The following illustration (modified Figure 10 of Longhi, Jr et al) is provided for clarification:



It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of having a first terminal / shooping electrically connect to a first current collector sheet and a second terminal / shooping electrically connect to a second current collector sheet, such that said first terminal / shooping is provided on said first side face of said EPA and said second terminal / shooping is provided on said second side face of said EPA of Longhi, Jr. et al. to the current collecting sheets of Lee et al. in order to provide improved connection of the current collectors that is easy to apply and that minimizes significant heating and resistance loss (col. 7, line 60 - col. 8, line 2). Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of a first current collector sheet and a second current collector sheet each having a conductive area connected to said first and second terminals, respectively, and each having an insulating area on said second and first side faces, respectively, where said first side face has a first insulating material portion / air gap for insulating said first terminal from said second electrode, and where said second side face has a second insulating material portion / air gap for insulating said second terminal from said first electrode of Longhi, J r. et al. to the electrochemical device of Lee et. al. in order to prevent the electrochemical device from short circuiting (8, lines 60-67).

The Examiner notes that the limitations “when said first current collector sheet has a conductive area and an insulating area…” (claim 2) and “when said second current collector sheet has a conductive area and an insulating area…” (claim 2) are interpreted as meaning to say that that at least one of the first and second current

collectors has a conductive area and an insulating area, and thus "[if/]when said first current collector sheet has a conductive area and an insulating area..." and thus "[if/]when said second current collector sheet has a conductive area and an insulating area…" according to the explanation given in the instant Specification (bottom page 3 - top page 4).

With regard to claims 9-10, Lee et al. fails to specifically state that said EPA comprises a third side face or a fourth side face, or teach that an edge of said first current collector sheet, an edge of said second current collector sheet, and an edge of said separator are flush with one another on each of said first side faces, said second side faces, said third side faces, or said fourth side faces, or teach the specified surface area relationships between the current collectors and the separator.

Longhi, Jr et al. teaches the concept of and edge said first electrode & current collector and an edge of said second electrode & current collector sheet can be flush on a first side face, a second side face, a third side face, and a fourth side face of said EPA (col. 11, lines 50-55; Figures 10-11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of said first current collector sheet being flush with an edge of said second current collector sheet flush on a first side face, a second side face, a third side face, and a fourth side face said EPA of Longhi, Jr. et al. to the current collectors of Lee et al. in order to make the manufacturing process easier and faster.

Modified Lee et al. fails to teach that the separator can be flush with the first and second current collector sheets on a first side face, a second side face, a third side

face, and a fourth side face of said EPA, or teach the specified surface area relationships between the current collectors and the separator.

While modified Lee et al. fails to teach that the separator can be flush with the first and second current collector sheets on a first side face, a second side face, a third side face, and a fourth side face of said EPA, or teach the specified relationship between the current collectors and the separator, one of ordinary skill in the art would understand that it would be advantageous to have the separator be flush with the first and second current collector sheets on a first side face, a second side face, a third side face, and a fourth side face of said EPA thereby having the area per one side of said first current collector (S(1)), the area per one side of said second current collector (S(2)), and the area per one side of said separator (S(s)) all be the same (S(1) = S(2) = S(3)), which would meet the relationships $S(1) \leq S(s) \leq S(1) * 1.05$ and $S(2) \leq S(s) \leq S(2) * 1.05$, in order to make the manufacturing process easier and faster (if the separator is not flush with the first and second current collector sheets on a first side face, a second side face, a third side face, and a fourth side face of said EPA, then the process of stacking the sheets / layers becomes more complicated and the possibility of sheet / layer alignment problems is increased).

6. Claims 11-13, 30-31, 33, & 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 2003/0104273) in view of Longhi, Jr. et al. (US 6,923837) and Dudley et al. (US 2002/0197535).

With regard to claims 11-12, 30, & 35-36, Lee et al. teaches an electrochemical device (paragraphs [0002], [0020], & [0112]) comprising an electrode plate assembly (EPA) (paragraphs [0028] & [0054]), said EPA comprising:

At least one first electrode (8, paragraph [0054]; Figure 3) comprising a first current collector sheet (11, paragraph [0054]; Figure 3) and at least one first electrode mixture layer carried thereon (13, paragraph [0054]; Figure 3),

At least one second electrode (7, paragraph [0054]; Figure 3) comprising a second current collector sheet (12, paragraph [0054]; Figure 3) and at least one first electrode mixture layer carried thereon (14, paragraph [0054]; Figure 3), and

A separator interposed between the first electrode and the second electrode (15, paragraph [0055]; Figure 3),

Where said first current collector sheet comprises a first edge that has a part that extends from a first side of said EPA and does not carry said first electrode mixture on it (Figure 3), and where said second current collector comprises a second edge that has a part that extends from a second side of said EPA and does not carry said second electrode mixture on it (Figure 3),

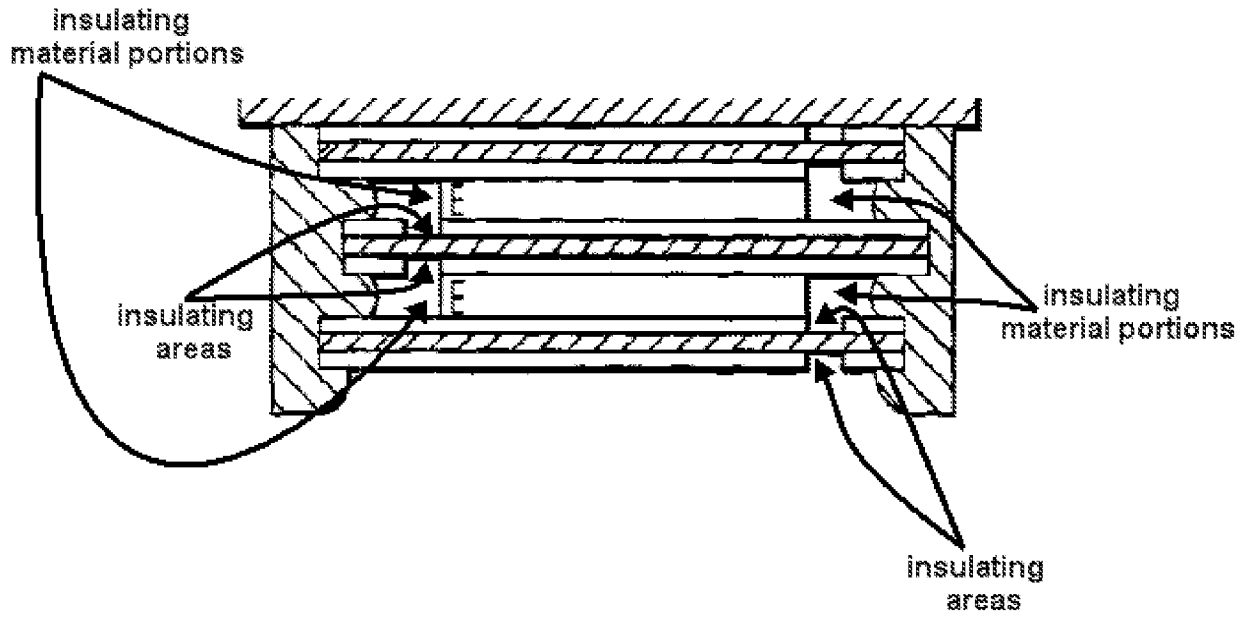
But fails to teach first and second terminals, or teach that at least one of said first and second current collector sheets has a conductive area and an insulating area, teach that said first and second electrode mixture layers have an edge covered with an insulating material, or teach the specified position of the insulating material on said first and second electrode mixture layers, or teach the specified composition of the insulating material, or teach first and second insulating material portions.

Longhi, Jr et al. teaches the concept of an EPA having a first electrode & current collector sheet extend from a first side of said EPA and having a second electrode & current collector extend from a second side of said EPA, where said first side face and said second side face are positioned on opposite sides of said EPA (col. 8, lines 52-67 & col. 4, lines 29-30 & 37-44; Figure 10), where a first terminal / shooping electrically connects to said first electrode & current collector sheet and a second terminal / shooping electrically connects to said second electrode & current collector sheet, such that said first terminal / shooping is provided on said first side face of said EPA and said second terminal / shooping is provided on said second side face of said EPA (col. 8, lines 52-67; Figure 10), and where said first electrode & current collector sheet and said second electrode & current collector sheet each have a conductive area connected to and buried in said first and second terminals, respectively, (col. 8, lines 52-67; Figure 10) and each have an insulating area (90, col. 8, lines 60-67; Figure 10) on said second and first side faces, respectively (col. 8, lines 60-67; Figure 10), and where said first side face has a first insulating material portion / air gap for insulating said first terminal from said second electrode (col. 8, lines 60-67; Figure 10), and where said second side face has a second insulating material portion / air gap for insulating said second terminal from said first electrode (col. 8, lines 60-67; Figure 10),

and where the end current collector sheets of the outermost two electrodes each have a conductive area on both sides such that the conductive area on the outermost side of each of said current collectors are electrically connected to said respective

terminals and serve as an extended part of said respective terminals (col. 4, lines 29-30 & 37-44 &; Figure 10).

The following illustration (modified Figure 10 of Longhi, Jr et al) is provided for clarification:



It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of having a first terminal / shooping electrically connect to a first current collector sheet and a second terminal / shooping electrically connect to a second current collector sheet, such that said first terminal / shooping is provided on said first side face of said EPA and said second terminal / shooping is provided on said second side face of said EPA of Longhi, Jr. et al. to the current collecting sheets of Lee et al. in order to provide improved connection of the current collectors that is easy to apply and that minimizes significant heating and resistance loss (col. 7, line 60 - col. 8, line 2). Furthermore, it would have been obvious to one of ordinary skill in the art at the

time of the invention to add the concept of a first current collector sheet and a second current collector sheet each having a conductive area connected to said first and second terminals, respectively, and each having an insulating area on said second and first side faces, respectively, where said first side face has a first insulating material portion / air gap for insulating said first terminal from said second electrode, and where said second side face has a second insulating material portion / air gap for insulating said second terminal from said first electrode of Longhi, J r. et al. to the electrochemical device of Lee et. al. in order to prevent the electrochemical device from short circuiting (8, lines 60-67).

Modified Lee et al. fails to teach that said first and second electrode mixture layers have an edge covered with an insulating material, or teach the specified position of the insulating material on said first and second electrode mixture layers.

Dudley et al. teaches the concept of an EPA having a first side face and a second side face, where a current collector extends from a first side face of the EPA (paragraph [105]; Figure 6C), and where an insulating material (110, paragraphs [0105]-[0106]) covers the edges of electrode mixture layers (paragraphs [0105]-[0106]) on the second side face (Figure 6C) in order to provide the electrode mixture layers with insulating barriers between the cathode, anode, and current collector on a side of the EPA opposite the side where the corresponding current collector is extending out (paragraph [0106]; Figure 6C).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of having an insulating material cover the edges of

electrode mixture layers on a face of Dudley et al. to the EPA of modified Lee et al. in order to provide the electrode mixture layers with insulating barriers between the cathode, anode, and current collector on a side of the EPA opposite the side where the corresponding current collector is extending out (paragraph [0106]; Figure 6C).

The Examiner notes that claim 30 recites that said insulating material comprises “at least one selected from the group consisting of a resin coating and a resin tape” (claim 30), and that the limitation of the insulating material consisting of a resin coating is rejected above. Therefore, claims 35-36, which depend from claim 30, are also rejected above where the limitation "a resin coating film” was rejected.

The Examiner notes that the limitations “when said first current collector sheet has a conductive area and an insulating area…” (claim 11) and “when said second current collector sheet has a conductive area and an insulating area…” (claim 11) are interpreted as meaning to say that that at least one of the first and second current collectors has a conductive area and an insulating area, and thus "[if/]when said first current collector sheet has a conductive area and an insulating area..." and thus "[if/]when said second current collector sheet has a conductive area and an insulating area…” according to the explanation given in the instant Specification (bottom page 3 - top page 4).

With regard to claim 13, modified Lee et al. fails to specifically state that the insulating material covering the edges of the electrode mixture layers on a side of the EPA opposite the side where the corresponding current collector is extending out would be adjacent to the insulating area of said current collectors.

While modified Lee et al. fails to specifically state that the insulating material covering the edges of the electrode mixture layers on a side of the EPA opposite the side where the corresponding current collector is extending out would be adjacent to the insulating area of said current collectors, one of ordinary skill in the art at the time of the invention would understand that Lee et al. as modified by Longhi, Jr. et al. and Dudley et al. as discussed above would obviously result in the insulating material covering the edges of the electrode mixture layers on a side of the EPA opposite the side where the corresponding current collector is extending out being adjacent to the insulating area of the current collectors (see Lee et al.: Figures 5A-5B, Longhi, Jr. et al.: Figure 10, & Dudley et al.: Figure 6C).

The Examiner notes that the limitations “when said first current collector sheet has a conductive area and an insulating area…” (claim 13) and “when said second current collector sheet has a conductive area and an insulating area…” (claim 13) are interpreted as meaning to say that that at least one of the first and second current collectors has a conductive area and an insulating area, and thus "[if/]when said first current collector sheet has a conductive area and an insulating area..." and thus "[if/]when said second current collector sheet has a conductive area and an insulating area…” according to the explanation given in the instant Specification (bottom page 3 - top page 4).

With regard to claims 31 & 33, the product-by-limitations of claims 31 & 33 are not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (MPEP 2113).

Moreover, a product-by-process limitation is held to be obvious if the product is similar to a prior art product (MPEP 2113). Claims 31 & 33 as written do not distinguish the product of the instant application from the product of the prior art.

7. Claims 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 2003/0104273) in view of Longhi, Jr. et al. (US 6,923837) and Lyman (US 5,567,544).

With regard to claims 14-15, Lee et al. teaches an electrochemical device (paragraphs [0002], [0020], & [0112]) comprising an electrode plate assembly (EPA) (paragraphs [0028] & [0054]), said EPA comprising:

At least one first electrode (8, paragraph [0054]; Figure 3) comprising a first current collector sheet (11, paragraph [0054]; Figure 3) and at least one first electrode mixture layer carried thereon (13, paragraph [0054]; Figure 3),

At least one second electrode (7, paragraph [0054]; Figure 3) comprising a second current collector sheet (12, paragraph [0054]; Figure 3) and at least one first electrode mixture layer carried thereon (14, paragraph [0054]; Figure 3), and

A separator interposed between the first electrode and the second electrode (15, paragraph [0055]; Figure 3),

Where said first current collector sheet comprises a first edge that has a part that extends from a first side of said EPA and does not carry said first electrode mixture on it (Figure 3), and where said second current collector comprises a second edge that has a

part that extends from a second side of said EPA and does not carry said second electrode mixture on it (Figure 3),

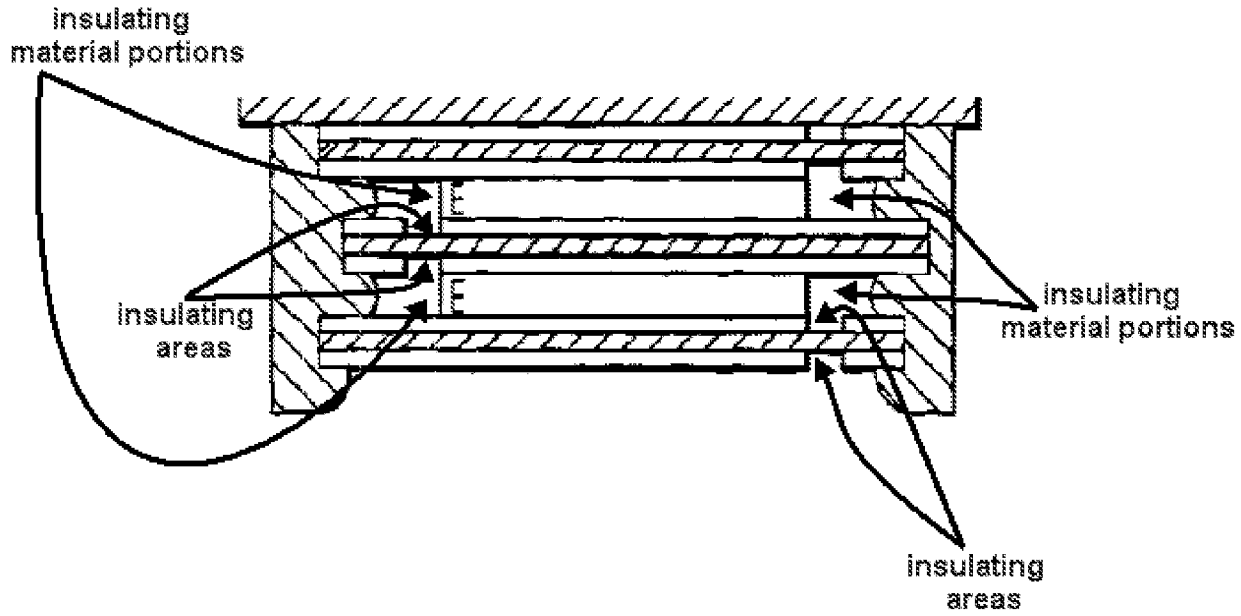
But fails to teach first and second terminals, or teach that at least one of said first and second current collector sheets has a conductive area and an insulating area, or teach first and second insulating material portions, or teach a case of a specified structure.

Longhi, Jr et al. teaches the concept of an EPA having a first electrode & current collector sheet extend from a first side of said EPA and having a second electrode & current collector extend from a second side of said EPA, where said first side face and said second side face are positioned on opposite sides of said EPA (col. 8, lines 52-67 & col. 4, lines 29-30 & 37-44; Figure 10), where a first terminal / shooping electrically connects to said first electrode & current collector sheet and a second terminal / shooping electrically connects to said second electrode & current collector sheet, such that said first terminal / shooping is provided on said first side face of said EPA and said second terminal / shooping is provided on said second side face of said EPA (col. 8, lines 52-67; Figure 10), and where said first electrode & current collector sheet and said second electrode & current collector sheet each have a conductive area connected to and buried in said first and second terminals, respectively, (col. 8, lines 52-67; Figure 10) and each have an insulating area (90, col. 8, lines 60-67; Figure 10) on said second and first side faces, respectively (col. 8, lines 60-67; Figure 10), and where said first side face has a first insulating material portion / air gap for insulating said first terminal from said second electrode (col. 8, lines 60-67; Figure 10), and where said second side

face has a second insulating material portion / air gap for insulating said second terminal from said first electrode (col. 8, lines 60-67; Figure 10),

and where the end current collector sheets of the outermost two electrodes each have a conductive area on both sides such that the conductive area on the outermost side of each of said current collectors are electrically connected to said respective terminals and serve as an extended part of said respective terminals (col. 4, lines 29-30 & 37-44 &; Figure 10).

The following illustration (modified Figure 10 of Longhi, Jr et al) is provided for clarification:



It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of having a first terminal / shooping electrically connect to a first current collector sheet and a second terminal / shooping electrically connect to a second current collector sheet, such that said first terminal / shooping is provided on

said first side face of said EPA and said second terminal / shooping is provided on said second side face of said EPA of Longhi, Jr. et al. to the current collecting sheets of Lee et al. in order to provide improved connection of the current collectors that is easy to apply and that minimizes significant heating and resistance loss (col. 7, line 60 - col. 8, line 2).

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of a first current collector sheet and a second current collector sheet each having a conductive area connected to said first and second terminals, respectively, and each having an insulating area on said second and first side faces, respectively, where said first side face has a first insulating material portion / air gap for insulating said first terminal from said second electrode, and where said second side face has a second insulating material portion / air gap for insulating said second terminal from said first electrode of Longhi, J r. et al. to the electrochemical device of Lee et. al. in order to prevent the electrochemical device from short circuiting (8, lines 60-67).

Modified Lee et al. fails to teach a case of a specified structure.

Lyman teaches an electrochemical device (col. 4, lines 36-39; Figures 5 & 7) comprising multiple EPAs (col. 4, lines 36-39 & col. 11, lines 30-56; Figures 5 & 7) and a case (54 & 56 & 52, col. 6, lines 31-47; Figures 5 & 7) accommodating said EPAs (col. 6, lines 31-47; Figures 5 & 7), where said case comprises a frame (52, col. 6, lines 31-47; Figures 5 & 7) and two flat sheets (54 & 56, col. 6, lines 31-47; Figures 5 & 7) such that said frame surrounds the EPAs and is in contact with said first and second side

faces of said EPAs (col. 6, lines 31-47; Figures 5 & 7), and such that said two flat sheets cover two openings of said frame (col. 6, lines 31-47; Figures 5 & 7) and are in contact with upper and lower faces of said EPAs (col. 6, lines 31-47; Figures 5 & 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the case of Lyman to the electrochemical device of modified Lee et al. in order to protect the EPAs and ensure the EPAs stay in specified orientations / locations with respect to each other (col. 6, lines 30-34).

With regard to claim 16, modified Lee et al. fails to teach that the case can comprise a container and one flat sheet instead of a frame with two flat sheets.

While modified Lee et al. fails to teach that the case can comprise a container and one flat sheet instead of a frame with two flat sheets, one of ordinary skill in the art at the time of the invention would understand that it would be advantageous to combine one flat sheet and the frame to make a container that the other flat sheet can fit on in order to decrease the possibility of alignment problems among the EPAs, the frame, and the flat sheets, thereby increasing ease of manufacturing.

The Examiner notes that the limitations “when said first current collector sheet has a conductive area and an insulating area…” (claim 14) and “when said second current collector sheet has a conductive area and an insulating area…” (claim 14) are interpreted as meaning to say that that at least one of the first and second current collectors has a conductive area and an insulating area, and thus "[if/]when said first current collector sheet has a conductive area and an insulating area..." and thus "[if/]when said second current collector sheet has a conductive area and an insulating

area…" according to the explanation given in the instant Specification (bottom page 3 - top page 4).

With regard to claims 17-19, modified Lee et al. fails to teach lead piece(s) connected to said first and/or second terminals and drawn out of said case through a slit in said case frame / sidewalls.

Lyman teaches the concept of having leads / pins (60 / 180, col. 6, lines 47-53 & col. 13, lines 50-54; Figures 12 & 5 & 7) connect to the anode and cathode, which comprise current collectors (col. 4, lines 36-39 & col. 11, lines 30-56; Figures 5 & 7), of an EPA (col. 4, lines 36-39 & col. 11, lines 30-56; Figures 5 & 7) and be drawn out of / extend through a slit / hole in the case frame / sidewalls (col. 6, lines 47-53 & col. 13, lines 50-54; Figures 12 & 5 & 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of having leads / pins connect to current collectors / terminals of an EPA and be drawn out of / extend through a slit / hole in the case frame / side walls of Lyman to the electrochemical device of modified Lee et al. in order to allow easy utilization of the power the electrochemical device provides.

8. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 2003/0104273) in view of Longhi, Jr. et al. (US 6,923837), as applied to claim 2 above, and further in view of Kawakami et al. (US 6,051,340).

With regard to claims 20-22, Lee et al. teaches that the first and second current collectors can be metal foil (paragraphs [0007] & [0054]), but fails to teach that the first and second current collectors and terminals can be made of the specified materials.

Kawakami et al. teaches that current collectors can be made in a foil-like form, mesh form, porous form-like sponge form, or punching metal form (col. 14, lines 40-42), and can be made of a metal or metal alloy such as Sn, Sn-Bi, or Sn-Pb (col. 14, lines 43-46 & 60-63), or can be made of a mixture of fine conductive particles (col. 14, line 65 - col. 15, line 2) and a polymer such as fluorine-containing resin or silicone resin (col. 14, line 65 - col. 15, line 2 & col. 15, lines 4-7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the current collectors of modified Lee et al. with the current collectors of Kawakami et al. because these are known to be effective current collectors in batteries and one would have a reasonable expectation of success in doing so.

Modified Lee et al. fails to teach that the current collectors and terminals can be made of the same material.

While modified Lee et al. fails to teach that the current collectors and terminals can be made of the same material, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the current collectors and terminals out of the same material because this practice is commonly known in the art, as evidenced by Brown et al. (US 2003/0113632, paragraph [0035]) and one would have a reasonable expectation of success in doing so.

9. Claims 23 & 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 2003/0104273) and Longhi, Jr. et al. (US 6,923837), as applied to claims 7 & 9 above, and further in view of Lyman (US 5,567,544).

With regard to claim 23, Lee et al. fails to teach that a metal lead is welded to each of said first and second terminals.

Lyman teaches the concept of having leads / pins (60 / 180, col. 6, lines 47-53 & col. 13, lines 50-54; Figures 12 & 5 & 7) connect to the anode and cathode, which comprise current collectors (col. 4, lines 36-39 & col. 11, lines 30-56; Figures 5 & 7), of an EPA (col. 4, lines 36-39 & col. 11, lines 30-56; Figures 5 & 7) and be drawn out of / extend through a slit / hole in the case frame / sidewalls (col. 6, lines 47-53 & col. 13, lines 50-54; Figures 12 & 5 & 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of having leads / pins connect to current collectors / terminals of an EPA and be drawn out of / extend through a slit / hole in the case frame / side walls of Lyman to the electrochemical device of modified Lee et al. in order to allow easy utilization of the power the electrochemical device provides.

With regard to claims 25-29, Lee et al. teaches that its separators can be made of polypropylene (paragraph [0016]), but fails to teach that at least one of said third side face and fourth side face is covered with an electronically insulating porous material.

Lyman teaches an electrochemical device (col. 4, lines 36-39; Figures 5 & 7) comprising multiple EPAs (col. 4, lines 36-39 & col. 11, lines 30-56; Figures 5 & 7) and a case (54 & 56 & 52, col. 6, lines 31-47; Figures 5 & 7) accommodating said EPAs (col.

6, lines 31-47; Figures 5 & 7), where said case comprises a frame / film-shaped member (52, col. 6, lines 31-47; Figures 5 & 7), made of electronically insulating material polypropylene (col. 6, lines 33-36), and two flat sheets (54 & 56, col. 6, lines 31-47; Figures 5 & 7) such that said frame surrounds the EPAs and covers and is joined to said third and fourth side faces of said EPAs (col. 6, lines 31-47; Figures 5 & 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the case of Lyman to the electrochemical device of modified Lee et al. in order to protect the EPAs and ensure the EPAs stay in specified orientations / locations with respect to each other (col. 6, lines 30-34).

Modified Lee et al. fails to teach that the frame / film-shaped member is made of porous polypropylene.

While modified Lee et al. fails to teach that the frame / film shaped member is made of porous polypropylene, one of ordinary skill in the art would understand that it would be obvious to make the frame / film shaped member of modified Lee et al. out of the same type of polypropylene as the separators of modified Lee et al. which can be polypropylene coated with porous polypropylene (Lee et al; (paragraphs [0030]-[0033], [0055], [0016], & [0069]).

10. Claims 32 & 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 2003/0104273), Longhi, Jr. et al. (US 6,923837), and Dudley et al. (US 2002/0197535), as applied to claims 31 & 30 above, respectfully, and further in view of Yamashita et al. (US 6,287,720).

With regard to claims 32 & 34, modified Lee et al. fails to teach the specified composition of said insulating material.

Yamashita et al. teaches that polyester resin, polyacrylonitrile, polymethyl methacrylate, polyvinylidene fluoride polyethylene oxide, and polypropylene oxide are all insulating materials (col. 6, lines 58-59 & col. 7, lines 7-18) that can be used in batteries (col. 6, lines 40-42).

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the polyester insulating material of modified Lee et al. with the polyacrylonitrile, polymethyl methacrylate, polyvinylidene fluoride polyethylene oxide, or polypropylene oxide insulating material of Yamashita et al. because polyacrylonitrile, polymethyl methacrylate, polyvinylidene fluoride polyethylene oxide, and polypropylene oxide are known to be effective insulating materials in a battery and because polyacrylonitrile, polymethyl methacrylate, polyvinylidene fluoride polyethylene oxide, and polypropylene oxide are known equivalents with polyester resin insulating material and therefore one would have a reasonable expectation of success in doing so.

Terminal Disclaimer

11. The terminal disclaimer filed on November 20, 2009 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of Patent Number 7,547,489 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

Information Disclosure Statement

12. Applicant's arguments with regard to the objections to the Information Disclosure Statement (IDS) regarding not receiving explanations of relevance or translations of the Japanese Office Actions issued in Japanese Patent Application No JP 2003-091143 dated January 6, 2009 and Japanese Patent Application JP 2003-409710 dated April 2, 2009, respectively, or of JP 11-505958, filed on November 20, 2009, have been fully considered and the Examiner's objections are withdrawn due to the Applicant's amendments and arguments.

Double Patenting

13. Applicant's Terminal Disclaimer filed November 20, 2009 has been approved and overcomes the provisional obviousness-type double patenting rejection. Therefore, the provisional obviousness-type double patenting rejection is withdrawn.

Claim Rejections - 35 USC § 112

14. Applicant's arguments with regard to the rejections of claims 2-3 & 7-36, filed on November 20, 2009, have been fully considered and the Examiner's rejections are withdrawn due to the Applicant's amendments and arguments.

Claim Rejections - 35 USC § 103

15. Applicant's arguments, see Applicant's Response pages 17-18, filed November 20, 2009, with respect to the rejections of claims 2-3 & 7-36 under 103 have been fully

considered and are persuasive because the Examiner made an inaccurate interpretation and rejection of the term “insulating material portion” in claim 4. Therefore, the rejection has been withdrawn.

However, upon further consideration, a new ground(s) of rejection is made in view of Lee et al. (US 2003/0104273) in view of Longhi, Jr. et al. (US 6,923,837).

16. Applicant's arguments filed November 20, 2009 have been fully considered but they are not persuasive.

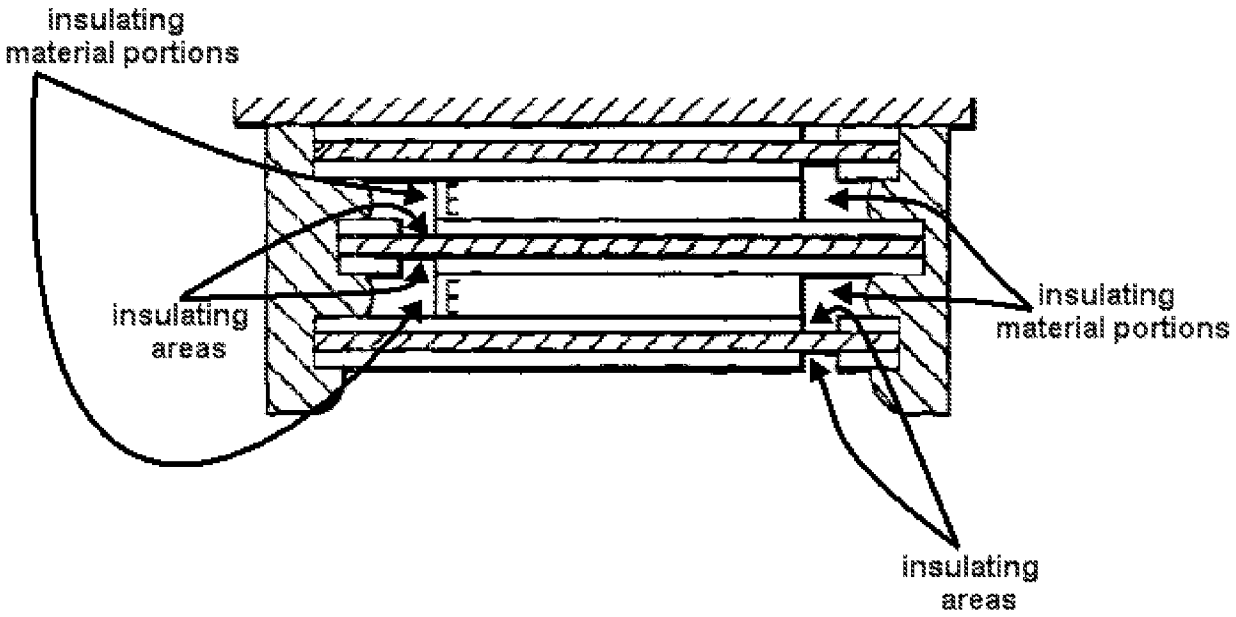
On pages 19-20 of the Applicant’s Response, Applicants argue that “nowhere in the cited prior art is there any indication of an insulating material portion such as 18a and 18b located at either side face of the device. As can be seen in, for example, Figs. 1-7 of Lee or Figs. 7, 9, or 10 of Longhi Jr, there simply is no insulating material portion on either the first or second side faces of the electrode plate assembly. Moreover, the Office Action fails to discuss this feature” (Applicant’s Response, page 19).

The Examiner respectfully disagrees with the Applicants argument that that “nowhere in the cited prior art is there any indication of an insulating material portion such as 18a and 18b located at either side face of the device. As can be seen in, for example, Figs. 1-7 of Lee or Figs. 7, 9, or 10 of Longhi Jr, there simply is no insulating material portion on either the first or second side faces of the electrode plate assembly. Moreover, the Office Action fails to discuss this feature” (Applicant’s Response, page 19) because:

1) In the prior Office Action claims 2-4 & 7-36 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner went on to explain that the limitation "insulating material portion" is indefinite because it is unclear exactly how this related to the "insulating area" of claim 2. For Examination purposes, the term "insulating material portion" was interpreted as being synonymous with the term "insulating area"; and

2) Due to the Applicant's response to the 112 rejection and clarification of what is meant by / exactly how the "insulating area" of claim 2 relates to the "insulating material portion(s)" of claim 4 in the Applicant's Response (pages 17-18), the Examiner has made a new rejection. Longhi, Jr et al. teaches that said first electrode & current collector sheet and said second electrode & current collector sheet each have a conductive area connected to and buried in said first and second terminals, respectively, (col. 8, lines 52-67; Figure 10) and each have an insulating area (90, col. 8, lines 60-67; Figure 10) on said second and first side faces, respectively (col. 8, lines 60-67; Figure 10), and that said first side face has a first insulating material portion / air gap for insulating said first terminal from said second electrode (col. 8, lines 60-67; Figure 10), and that said second side face has a second insulating material portion / air gap for insulating said second terminal from said first electrode (col. 8, lines 60-67; Figure 10).

The following illustration (modified Figure 10 of Longhi, Jr et al) is provided for clarification:



Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLAIRE L. RADEMAKER whose telephone number is (571)272-9809. The examiner can normally be reached on Monday - Thursday, 8:00AM - 4:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. L. R./
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795